AMENDMENTS TO THE SPECIFICATION:

Replace the title on line 1 of page 1 with the following amended title:

IN-LINE ROLLER SKATE WHEEL AND METHOD OF MAKING SAME

Replace the paragraph beginning at line 8 on page 4 in its entirety with the following amended paragraph:

U.S. Patent No. 5,655,784 to Lee discloses [[a]] solid tires ~~mounted on a light weight fiber reinforced hub to reduce flex and attain greater speed. U.S. Patent No. 5,725,284 to Boyer discloses a wheel constructed of a plurality of layers of material disposed concentrically about a hub with the hardest material being on the outermost layer. U.S. Patent No. 5,829,757 to Chiang et al discloses an in-line skate wheel with materials of similar hardness but different coefficient of friction values on different portions of the tires surface. The braking portion of the tire contains a high coefficient of friction material while the normal skating surface includes a high proportion of the low coefficient of friction material. This is touted as allowing the skater to proportionally engage the braking surface and control braking by leaning into the wheel and changing the angle to increase braking action.~~ of some undefined manufacture, possibly molded on light weight fiber-reinforced hubs. The Lee wheels are intended to be mounted under a skate shoe in longitudinal relationship and with hard tires having a hardness on the order of 85 durometers on the D scale to act more like ice-skate blades. The tires are intended to be of decreased friction. Such wheels suffer the shortcoming that they would not provide the structural support and high friction grip required for

highly athletic maneuvers typically associated with in line team contests such as hockey or racing. Lee mentions that the tire can be made of thermosetting or thermoplastic polyurethane but does not disclose any procedure for casting the wheel body itself or any benefits of casting the wheel.

Please add the following new paragraph after the paragraph beginning at line 8 on page 4:

U.S. Patent No. 5,725,284 to Boyer discloses a wheel constructed of a plurality of layers of material disposed concentrically about a hub with the hardest material being on the outermost layer. U.S. Patent No. 5,829,757 to Chiang et al discloses an in-line skate wheel with materials of similar hardness but different coefficient-of-friction values on different portions of the tires surface. The braking portion of the tire contains a high coefficient-of-friction material while the normal skating surface includes a high proportion of the low coefficient-of-friction material. This is touted as allowing the skater to proportionally engage the braking surface and control braking by leaning into the wheel and changing the angle to increase braking action.

Replace the paragraph beginning at line 1 of page 5 in its entirety with the following amended paragraph:

These wheels each provide specific benefits but are generally complex, difficult to manufacture, and not optimized for high speed competition such as roller hockey and racing which benefits from a reduced moment of inertia and high friction gripping on

quick powerful starts, acceleration, braking and turns. There exists the need for a lightweight skate wheel which will provide a fast, smooth ride with excellent gripping, maneuverability and durability. ~~but without the complexity and expense of producing multi-segmented or pneumatic tires.~~ There is also a need to provide a method and apparatus for casting a wheel using a simple one piece tire, cast from urethane, and allowing use of unique profiles to reduce weight and enhance performance for any desired skating conditions.

Replace the paragraph beginning at line 9 of page 5 in its entirety with the following amended paragraph:

The present invention includes many aspects. In one aspect it is in the form of a sculptured lightweight narrow in-line skate wheel particularly suited for, but not limited to quick acceleration and sharp turning characteristics such as are important for quick turn maneuvers as employed in roller hockey and racing contests. The wheel includes a relatively hard, lightweight urethane hub and a solid resilient urethane tire body. ~~with reduced hardness relative to the hub.~~ The hub is constructed with a narrow axial support flange to cause the body of the wheel to be formed at its radially inner extent with a correspondingly narrower tire body width tapered axially inwardly from the opposite sides to cooperate in providing a low moment of inertia. In one embodiment the tire body is configured with a narrow crown to cooperate with the low moment of inertia to facilitate shifting of the wheel quickly from a turning position inclined in one direction to a position inclined in the opposite direction.

Replace the paragraph beginning on line 1 of page 6 in its entirety with the following amended paragraph:

In one embodiment, the lightweight hub is formed with a transverse, annular bearing housing with oppositely opening bearing glands for insertion of a pair of bearings to mount on a skate wheel axle to carry heavy loads associated with quick controlled turns. The hub projects radially outward from this bearing housing in the form of an annular support disk which carries the annular support flange. The tire is mounted on the annular support flanges and encases a stabilizer ring that projects radially outwardly from the support flange. The radial stabilizer ring projects radially outwardly to cooperate in forming a tall profile projecting radially outwardly into the tire body to provide support under the tread to decrease deflection and rolling resistance~~,thus providing greater straight line speed.~~ to the relatively soft tire body, thus providing for quicker acceleration and sharper turns. The radial stabilizer ring profile is relatively thin, allowing a greater amount of the softer tire material on the sidewalls, promoting increased grip and maneuverability.

Replace the paragraph beginning on line 11 of page 6 in its entirety with the following amended paragraph:

In another [[one]] embodiment the hub is sectioned into two axial flanking sections which join to form the hub itself. The annular support disk may be formed with an annular tube or shell configured with the lightening cavity. Such shell and/or hubs

may be sectioned to provide for ease of fabrication in sections to be joined by a mechanical joint and/or adhesive.

Replace the paragraph beginning on line 3 of page 11 in its entirety with the following amended paragraph:

Referring to FIGS. 1 and 2, the in-line roller skate wheel **20** of the present invention is of the two-piece construction including, generally, a hard hub **30** and a solid resilient high friction tire body **50**. The hub **30** is formed with a cylindrical bearing housing **31** including oppositely opening bearing glands **32** and **33** for insertion of a standard set of bearings to mount the wheel on an axle. Projecting radially outwardly from the bearing housing **31**, an annular stabilizer disk **34** supports a pair of annular support flanges **37** and **38** projecting in the opposite axial directions to form respective radially outwardly facing support surfaces. Such annular support flanges **37** and **38** cooperate with the annular stabilizer disk **34** in forming a tire body support that is advantageously narrow in axial cross section. The annular stabilizer disk **34** may projects radially outwardly beyond the annular support flanges **37** and **38** to form a radial stabilizer ring **39** which cooperates to provide radial, circumferential, and axial support and stability to the tire body **50** during skating maneuvers. Such ring is formed with through axial anchoring openings in the form of bores **40** spaced equidistant thereabout. As seen in FIG. 2, the annular stabilizer disk **34**, annular support flanges **37** and **38**, and radial stabilizer ring **39** cooperate to form a generally cruciform shape in transverse cross section.

Replace the paragraph beginning on line 16 of page 11 in its entirety with the following amended paragraph:

Referring still to FIG. 2, the ~~urethane~~ tire body **50** is made of a thermoset urethane formed with radially inwardly facing flanking bearing surfaces defining beads **54** and **55** that rest on the radially outwardly facing surfaces of the respective annular support flanges **37** and **38**~~, and the urethane material can be seen to encapsulate the radial stabilizer ring **39** and fill the through-bores **40** to solidly anchor the tire body **50** to the hub **30**.~~ It is known that thermoset controls linking in a tire body and can be tailored for the desired results. The thermoset liquid is floated into the cast mold at the appropriate ratio to give the desired results. It is known that thermoset tire bodies will retain about 80% of the bounce the original material had. Thermoplastic tire bodies, on the other hand, only have about 60% of the bounce of the original material which represents about a 40% loss of the bounce. The urethane material may encapsulate the radial stabilizer ring **39** and fill the through-bores **40** to solidly anchor the tire body **50** to the hub **30**. The short axial length of the annular support flanges **37** and **38** and relatively large diameter of the radial stabilizer ring **39** causes the tire body **50** to be formed with a narrow rounded central tread area **56** and the side walls to then angle radially inwardly and axially outwardly to a bulbous major width at line B-B (Fig. 2) from where such walls curve radially and axially inwardly toward one another defining the transition wall sections **51** and **52**. The exterior contour of such tire in the axial cross section then cooperates in forming a shape simulating that of the profile of the glass portion protruding from the

metal socket of a Christmas tree light bulb. This profile allows the skater to more quickly transition from one side of the wheel **20** to the other, increasing responsiveness. The narrower cross section of the tire body, and short axial length of the annular support flanges **37** and **38** causing the decreased-in-width cross section radially inwardly from the major diameter B-B, serve to provide for a lightweight polyurethane tire body **50**. It will be appreciated that in some embodiments of the present invention the disk **34** may project radially outwardly to the diameter of the respective flanges **37** and **38**.

Replace the paragraph beginning on line 17 of page 15 in its entirety with the following amended paragraph:

The lower <u>mold</u> [[mole]] section **71** is formed with an upwardly opening central annular cavity well **74** configured to complementally receive the axially lower portion of the bearing housing **31** and surrounding an axial centering post **75** configured to be complementally received in telescopical relationship in the lower end of such bearing housing. The radial outer walls forming the central annular cavity well **74** slope axially upwardly radially and outwardly to form an annular sealing lip **76** configured to be engaged telescopically in fluid light relationship on the radially inner side of the annular support flange **37**. The lower mold section **71** is then formed with a tire body wall concentric about the well **74** which curves radially outwardly and axially downwardly from the annular sealing lip **76** to form a narrowing section **77** forming the shape of the narrowing transition wall section **51** of the tire body and configured to have the axial

edge of the flange **37** nested there against. The lower mold section **71** then slopes axially downwardly to a maximum tire diameter and then slopes axially upwardly and radially outwardly to complete the form of one half the tire body terminating at a central separation line disposed at the crown of the tire body.

Replace the paragraph beginning on line 7 of page 19 in its entirety with the following amended paragraph:

In use, a set, generally four, of the light weight, low inertia wheels of the present invention is mounted on each of a pair of in-line roller skates. The performance advantages provided by these wheels will be appreciated by reviewing maneuvers a skater advances through in a typical competition and examining how the wheel's features cooperate to improve the skater's competitive edge. Initially, the skater must accelerate. ~~In this phase, the thin tire body profile and curving provide the tire opposite side walls radially inwardly toward one another to meet the respective ends of the short annular support flanges presents the benefit of reduced mass to form low intertia wheels. This allows rapid angular acceleration of the wheels themselves and the light weight of the skates to allow for quick strides, both contributing to rapid buildup of the skater's speed as the skater then transitions into the high speed phase straight line speed becomes of paramount importance. The tall profile of the radial stabilizer ring causes it to project well into the tire body material to provide greater support to the tread area to decrease deflection and consequent rolling resistance. The skater will now benefit from the relatively large light weight diameter wheel to further enhance speed. In addition to high~~

~~speed, a competition such as ice hockey also requires great maneuverability on the part of the skater.~~ During this phase as the hockey or recreational player strokes through the accelerating start, the relatively soft walls of the radially outwardly facing side walls of the powering skate will grip the support surface to provide the necessary friction to support the powerful pushing strokes angular acceleration of the wheels will be resisted by the mass of the wheels themselves. Such mass, particularly at some distance from the axial center line will contribute significantly to the interlia resisting angular acceleration. The mass of such wheels is kept to a minimum. By the fact the opposite side walls angle radially and axially inwardly toward one another to meet the respective ends of the short annular support flanges. This reduction in mass allows rapid angular acceleration of the wheels themselves to provide for quick strides, both contributing to rapid buildup of the skater's speed as the skater then transitions into the high speed phase straight line speed becomes of paramount importance. Quick turns and rapid deceleration and acceleration are critical to success. The relatively thin profile of the radial stabilizer ring provides for a significantly greater amount of the softer tire body on the opposite sides thereof to promote increased function and grip in the sidewall area for improved maneuverability and braking during turning maneuvers. The low inertia of the wheels also improves deceleration allowing them to stop spinning more quickly. As the competition goes on, it will be appreciated that the high friction, light weight skates require less expenditure of energy by the skater as the mass to be accelerated and decelerated in each stride is reduced. Additionally, the relatively soft tire body serves to provide for flexing of the surface thereof to accommodate irregularities and some variousness in the finish of the

support surface. This allows better sustained performance and more enjoyment on the part on the skater.

Replace the paragraph beginning on line 6 of page 22 in its entirety with the following amended paragraph:

The hub, when assembled and joined, can thus be casted with a tire body **154** thereabout in a manner similar to that shown for the wheel depicted in FIG. 7 as above. The tire body **154** is ~~constructed~~ relatively soft and resilient and is constructed at its radically outer extent with a narrow crown **156** defining a tread surface and walls which slope radially inwardly while angling axially outwardly to a major thickness **158** from where they curve or slope radially inwardly axially toward one another to join at the opposite outer extremities of the respective support flanges **114** and **138**. The wheel body **154** thus forms radically inwardly facing beads **162** and **164** which nest on the respective radially outwardly facing annular seats **116** and **140**. The construction thus affords a narrow lightweight wheel body which has a relatively narrow width and includes an annular void in the shell sections **118** and **144** to provide a relatively low mass to thus facilitate high performance skating.

Replace the paragraph beginning on line 15 of page 25 in its entirety with the following amended paragraph:

From the foregoing, it will be apparent that the narrow profile of the present invention provides a lightweight wheel that presents high performance gripping

characteristics while exhibiting a relatively low moment of inertia. The wheel has a pronounced pointed profile allowing for the greatest flex of the sidewalls and a small but firm contact patch in the center of the tire. These features promote high speed and maneuverability on tiled surfaces and the wheel is well suited for indoor hockey. It will however be appreciated that with minor alterations of the mold a slightly wider profile can be cast for indoor hockey on Roll-On™ or maple wood flooring. A ~~full wrap~~ profile can also be formed to place a greater amount of urethane on the tire to maximize durability for outdoor use. Other enhancements could include shims placed on the sides of the tire support rim to increase the rigidity of the wheel, decreasing the sidewall grip but increasing wheel speed.